

THE SEWAGE DISPOSAL.

Dr. N. B. Emerson's Views Expressed.

A MOST INTERESTING LECTURE.

Where Danger Lurks—The Treatment of Nonputrescible Matter—Proper Street Cleaning First—Sewerage Afterwards—Disinfection—Conditions.

Honolulu has reason to be congratulated that it has not committed itself to an antiquated system of sewerage, but is still free to choose and adopt the best.

Sanitary engineering is a progressive science and has made immense strides in the last two decades.

I presume there are many large cities that would be glad to occupy our position of freedom to choose, but they are in a sense handicapped by the expensive system to which they are already committed.

Take the city of Paris, for instance. In that vast metropolis the system in use, is the result of growth from and adaptation of works and methods that are heirlooms from the hoary past, with a result that is anything but satisfactory.

Says Mr. Waring, ("Sewerage and Land Drainage," p. 220 and 222) "Much has been said and written about the majestic sewers of Paris. Viewed solely as underground conduits of well constructed masonry the main sewers of this city are indeed majestic, and all of the recent work has been executed with rare skill. Concerning the lateral sewers, especially those of old construction the same cannot be said. The 'colle-eteur' under the Rue de Rivoli, which is the source of the impressions that the casual traveller brings away concerning these works, is periodically cleaned and whitewashed, and on certain days, when everything is in order, it is entered by a few favored visitors. I have never seen this sewer, but I have walked for some miles through other important sewers of Paris, wading nearly to my knees in slushy filth, and then bringing away a somewhat different impression from that made on the 'favored visitors'."

The knowledge thus gained has been supplemented by official reports and by conversations with engineers of the city since then, and especially by the discussions of the Sanitary Commission that was charged with the formulating of recommendations for the improvement of the general sanitary condition of the city of Paris. My conclusion is that the only lesson to be learned from these sewers is a caution against the repetition of similar works elsewhere.

As sewers, they perform in a very slight degree the duty which I have been taught to regard as a most important one. While they remove rain water and a large volume of water derived from the copious washing of the surface of the streets, they are in relatively few cases connected in any manner with the fouler drains of houses. The cesspool system is still substantially in use, and the wastes of water closets, etc., are almost entirely stored in them, with the general result of making Paris far from cleanly or healthy.

The Sanitary Commission have recommended extensive improvements and modifications of the sewer system, which have not yet been put into execution, and which, when fully carried out, will still leave much to be desired.

The sewerage of London, which, like that of Paris, is the combined system, is also the growth of generations. "It includes," says Mr. Waring, "an enormous amount of old work much of it very bad." The intercepting sewers which flank each side of the Thames and conduct the immense volume of sewage to Barking and Crossness, about twelve miles below London Bridge, together with the pumping and discharging works alone represent an investment of about \$30,000,000.

Yet the outcome of the system is no better than in Paris. The situation in these cities may be compared to that presented by a large sugar plantation which has built up a plant at an enormous expense and have to wakes up to the fact that it is not satisfactory, not economical; to continue with the same plant involves great waste, and to throw away and try again is a matter of enormous expense.

The Separate System of Sewerage.

1st The prime feature of this system is that rain and storm water are excluded from the sewer pipes intended for the transportation of sewerage proper.

This method avoids, first, the embarrassment which is seen to arise from the entrance of earth, sand and coarse rubbish into the sewer pipes, and the obstruction, or stoppages, resulting therefrom.

It would follow of course from the introduction of the separate system that definite provision would have to be made for the removal of surface and storm water, these being denied admission to the sewer pipes of the separate system.

Authorities on the subject assure us, however, that the problem of making separate provision for this waste water is attended with less difficulty than when it is poured into the same conduits with sewage proper.

If proper attention is given to paving and putting into solid condition the gutters of our streets these may without detriment be relied upon to carry off a large part of the storm water in the future as they have in the past.

There can be no doubt however that short sewers for storm water will be needed here and there.

This is an enormous gain.

2d. As a result of this exclusion of storm water and the waste of the streets, it has been found possible to

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reduce very greatly the size of the sewer pipe.

The great bulk of the maximum flow that at any time enters the sewer in the combined system, it must be remembered, is made up of surface wash and storm water.

Exclude this, and the maximum tide in a sewer shrinks to very ordinary dimensions.

A sewer pipe of eight, ten or twelve inches calibre at the most is found capable of receiving and transporting the sewage proper of a large town, with a steady and uninterrupted flow.

3d. Another point in favor of the Separate System is that the amount of water received into the sewer pipe remains nearly a constant quantity every day in the year, and all the year round.

The flow that enters it is not subject to those immense fluctuations which represent the difference between the precipitation of water in time of drought and the heaviest rainfall.

The volume of sewage proper in any community is found to be practically that of the water used for domestic purposes. It results from this that the size of the main sewer pipe, or pipes, in the Separate System may be determined by gauging the water consumption of the city.

4th. Another advantageous result of the Separate System is the fact that as the sewer pipes in this system are much smaller than in the Combined System, piping of iron and of glazed ware can economically be used in place of the huge conduits of masonry required by the Combined System.

This is a gain from many points of view. The smooth interior of an iron or vitrified earthen pipe, when properly jointed, offers less resistance to friction, other things being equal, than it is possible to secure in the case of a conduit constructed of brick and mortar. It is accordingly found that a sewer pipe in the Separate is much less liable to obstruction than in the Combined System.

Iron or vitrified pipes will also do their work satisfactorily with a small gradient than a brick sewer. This is a consideration of the greatest importance in the sewerage of a place that is very flat, as are the lower parts of Honolulu.

5th. The expense of the small-pipe sewers used in the Separate System is comparatively so small, being only a fraction of the outlay required for the large sewers of the Combined System, as to bring this system within the reach of many towns which would otherwise be altogether debarred from the use of any system of sewerage.

6th. The separate system has also another capital advantage over the combined system, in that it does away at once and entirely with the necessity for privy vaults and cesspools. It proposes to connect each house, or establishment, directly with the sewer pipe, so that all domestic wastes and foul waters that are properly classed into an iron or vitrified pipe of not less than four inches in diameter, says Mr. Waring, and passed along in continuous and uninterrupted flow to the main outlet or outlets of the sewer-trunk.

7th. In order to insure this uninterrupted and continuous flow throughout the whole system and prevent the possibility of obstruction, an automatic flush tank is placed at each dead end of a sewer pipe, the periodic overflow of which at certain regulated intervals absolves and sweeps out all the matters below. These flush tanks, which may contain four or five hundred gallons apiece, can be regulated so as to discharge at any desired interval of time, say every 12, or 18, or 20 hours. Their mechanism is simple, but automatic. They are arranged so that when full the accumulated water is discharged at once, and with a rush.

To quote from Mr. Waring, the City of Pawtucket is served on a sort of semi combined system, street water being kept out of the extended laterals, but roof water being taken in generally.

The work was done in the best and most expensive manner. Mr. Sweet said: "I consider the flush tank the life of a small-pipe system of sewers, for without it the system would be expensive, troublesome, and unless the greatest diligence is exercised it will surely fail. I had a good opportunity to test the value of flush tanks. (To be continued.)"

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An Excellent Performance and Large Returns—Mr. Wirth's Thanks.

Mr. Harry Wirth, proprietor of the circus, was a very busy man last night, for he had a big crowd of people to look after—more, perhaps, than ever before.

What the receipts were could not be ascertained as the company could not get returns from the different persons who had tick sale.

The regular performance of the circus company was given sides, there were extra acts by the Glee Club and the Comedy. Sylvester Kala Hawaiian clown, sang besides doing some clever acting.

In speaking of the great people present last night Mr. Wirth said to an Advvertiser reporter: "It is really how the circus continues and I must say that the greatest show town in Honolulu is Honolulu."

"I would be glad if you will thank the people of Honolulu, as well as the other columns of your paper, for the treatment they have accorded us since we arrived here."

"You know, of course, how we have been waiting here for a steamer to take us to Japan. We have, per chance, given performance that the public and short of it. I have not intended that it should be so, but so long as the public is anxious to see the performance I was glad to open the doors."

The last performance by which I shall benefit will be given in a matinee to the children tomorrow. In the evening Messrs. Burns and Price will take a benefit, at which a number of amateurs, including Mr. Finney of the Bulletin, will take part, and, by the way, Mr. Finney is the best club singer I ever saw anywhere."

Now, then, tell the public for me that the treatment I have received at their hands has been such that the Hawaiian Islands will always have a warm spot in my heart. My business relations here have been most pleasant. I hope I have the good will of every one, because I expect some time within the next two years to return with a much larger company.

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